

CLAIMS

- 1 1. A method for increasing a number of persistent consistency point images (PCPIs)
2 maintained for a volume of a storage system, the method comprising the steps of:
3 providing a file system information (fsinfo) block associated with an active file
4 system executing on the storage system;
5 providing one or more PCPI fsinfo blocks, each PCPI fsinfo block associated with
6 a PCPI; and
7 providing a volume information (volinfo) block at a predetermined location on
8 disk of the storage system, the volinfo block comprising a plurality of pointers configured
9 to reference the fsinfo and PCPI fsinfo blocks.
- 1 2. The method of claim 1 wherein the pointers comprise volume block numbers.
- 1 3. The method of claim 1 further comprising the steps of:
2 organizing the pointers as a table having a plurality of entries, each entry storing a
3 pointer; and
4 indexing the entries of the table by PCPI identifier (ID).
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- 1 4. The method of claim 3 further comprising the step of associating the active file
2 system with a predefined PCPI ID.
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- 1 5. The method of claim 1 further comprising the steps of:
2 organizing the pointers as an array indexed by PCPI identifier (ID); and
3 associating the active file system with a predefined PCPI ID.
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- 1 6. The method of claim 5 wherein the predefined PCPI ID is zero.

- 1 7. The method of claim 1 wherein the fsinfo block comprises a pointer configured to
2 reference an inode file associated with the active file system.
- 1 8. The method of claim 1 wherein each PCPI fsinfo block comprises a pointer con-
2 figured to reference an inode file associated with a PCPI.
- 1 9. The method of claim 1 wherein the predetermined location comprises a first and
2 second volume block number.
- 1 10. The method of claim 1 wherein the volinfo block further comprises fields for
2 PCPIs that do not have associated PCPI fsinfo blocks referenced by the volinfo block.
- 1 11. A system adapted to maintain an increased number of persistent consistency point
2 images (PCPI) for a volume of a storage system, the system comprising:
3 at least one storage device adapted to store a volume information (volinfo) block
4 at a predefined location, the storage device further adapted to store a plurality of file sys-
5 tem information (fsinfo) blocks referenced by the volinfo block.
- 1 12. The system of claim 11 wherein the storage device is a disk.
- 1 13. The system of claim 11 wherein the predefined location comprises a first and sec-
2 ond volume block number.
- 1 14. The system of claim 11 wherein the fsinfo blocks comprise a first fsinfo block
2 associated with an active file system and having a pointer configured to reference an
3 inode file associated with the active file system.
- 1 15. The system of claim 11 wherein the volinfo block comprises an array of pointers
2 configured to reference the fsinfo blocks.

1 16. The system of claim 15 wherein the array of pointers is indexed by a PCPI identi-
2 fier (ID) and wherein an active file system is associated with a predefined PCPI ID.

1 17. The storage system of claim 15 wherein each pointer comprises a volume block
2 number.

1 18. Apparatus for increasing a number of persistent consistency point images (PCPIs)
2 maintained for a volume of a storage system, the apparatus comprising:

3 means for providing a file system information (fsinfo) block associated with an
4 active file system executing on the storage system;

5 means for providing one or more PCPI fsinfo blocks, each PCPI fsinfo block as-
6 sociated with a PCPI; and

7 means for providing a volume information (volinfo) block at a predetermined lo-
8 cation on disk of the storage system, the volinfo block comprising a plurality of pointers
9 configured to reference the fsinfo and PCPI fsinfo blocks.

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2 19. A computer readable medium, including program instructions executing on a
3 storage system, for increasing a number of persistent consistency point images (PCPIs)
4 maintained for a volume of the storage system, the computer readable medium including
5 program instructions for:

6 providing a file system information (fsinfo) block associated with an active file
7 system executing on the storage system;

8 providing one or more PCPI fsinfo blocks, each PCPI fsinfo block associated with
9 a PCPI; and

10 providing a volume information (volinfo) block at a predetermined location on
11 disk of the storage system, the volinfo block comprising a plurality of pointers configured
12 to reference the fsinfo and PCPI fsinfo blocks

- 1 20. The computer readable medium of claim 19 further comprising program instruc-
2 tions for:
3 organizing the pointers as an array indexed by PCPI identifier (ID); and
4 associating an active file system with a predefined PCPI ID.